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Executive Summary

Background

As the second study in a series of investigations of the incidence and outcome of mental disorder in the US Navy, this study focuses on active-duty men and women diagnosed with a neurotic disorder. The objectives of this study were (1) to determine first hospitalization incidence rates in an initially healthy young adult population by gender, race, and age, and to evaluate the effects of other demographic characteristics on onset and course of illness; and (2) to determine duration of acute illness, severity, and posthospital outcomes in terms of military performance and premature personnel losses.

Approach

First hospitalizations for neurotic disorders were extracted from automated medical record data files for all active-duty Navy personnel admitted between 1980 and 1988. Six neurotic disorder subtypes were formed and examined using the grouping of disorders given in ICD-9-CM: the Anxiety group, Hysteria group, Phobia group, Obsessive-Compulsive Disorder, Neurotic Depression, and Other Neurotic Disorder/NOS (Not Otherwise Specified). Incidence rates were calculated for major demographic subgroups, and career history records provided a 4-year follow-up of service-related outcomes.

Results

Neurotic and control groups did not differ on mental aptitude at the time of entry into service. Neurotics were disproportionately female. Considerable variation in the incidence, demographic composition, and outcomes of neurotic subtypes was found. Overall incidence ranged from a low of 3 per 100,000 for obsessive-compulsive disorders to a high of 58 per 100,000 for Other Neurotic Disorder/NOS. Other racial group females had both the lowest rate for phobias of less than 1 per 100,000 and the highest rate for Other Neurotic Disorder/NOS of 110 per 100,000. The Phobia and Depressive groups had the poorest prognoses for continued service, and the Other/NOS and Anxiety groups had the best prognoses.

Conclusions

There is evidence of diagnostic uncertainty during the study period. Adherence to clinical, criteria-based diagnostic systems and further longitudinal epidemiological investigations are needed to obtain accurate quantitative estimates of outcomes, to differentiate more severe

from less severe conditions and to help devise new strategies for identification, classification, referral, and management of neurotic disorders.

Mental disorders are a major burden for naval medical facilities and a leading cause of premature separation from service.[1] During the period 1980 to 1994, there were more than 170,000 hospitalizations for mental disorders among enlisted Navy personnel, and more than 100,000 of those personnel were prematurely separated from service because of impairment in work or social functioning or unacceptable behavior. The neuroses, including major depression and the anxiety disorders, account for the greatest number of new psychiatric cases observed in community psychiatric surveys[2-5] and constitute about 21% of the mental disorder inpatient admissions in the Navy.[6] Wide variations in the incidence of psychiatric illness across the different branches of military service and in a given service at different times has been attributed to variations in the nonpsychotic illnesses.[7] There has also been some evidence of an increase in depression rates between the 1950s and 1970s, particularly among young and middle-aged males.[4] Little is known about the rates of neurotic disorders among women in the military.

Unfortunately, studies of the incidence of specific neurotic disorders, as with other psychiatric conditions, are few. A majority of individuals with these disorders do not seek treatment and must be identified through community surveys. Follow-up of sufficiently large samples from such surveys to estimate incidence rates is complex and costly. Neurotic patients, if examined by physicians in civilian life, generally are not hospitalized but are usually diagnosed and treated in an outpatient setting. In the military, however, neurotic symptoms may noticeably affect the ability to carry out normal work and social activities, particularly in confined and crowded shipboard environments, and are more likely to be hospitalized for evaluation and treatment.[8] If left untreated, symptoms such as panic attacks and phobic avoidance, often precipitated by wearing protective gear or breathing apparatus aboard ships or aircraft, are incompatible with military service.[9] On the other hand, neuroses have shown responsiveness to nondrug treatments in the military[9] and generally are less likely than most other psychiatric diagnoses to lead to extended disability and separation from service.[6]

Nevertheless, little is known about the long-term effects of neuroses on work and social adjustment, and in spite of the fact that neuroses have been clinically described and treated for more than a century, the etiology and emotional and behavioral manifestations of the neuroses are still poorly understood.[8, 10, 11] Indeed, although the International Classification of Diseases World Health Organization (WHO) still retains the distinction between psychotic and neurotic states, for years investigators have regarded this distinction as no longer valid, useful, or

consistent.[12] However, there is evidence that neuroses are a distinct category with respect to symptomatology and outcome and as such may help provide insight into the understanding of these disorders. For example, a previous study of 4,074 Navy enlisted men found that anxiety and depression were the most common subtypes and that differences among four neurotic subtypes were significant with anxiety and hysterical neuroses having better prognoses than depressive or phobic-compulsive groups.[8] Also, neuroses had poorer prognoses than transient situational disturbances or psycho-physiological disorders but much better prognoses in terms of continued naval service than psychoses or personality disorders.[7] Unfortunately, there has been little systematic examination of these disorders with respect to incidence, course, and prognosis in the almost 30 years since that men-only study.

Women are at higher risk for neurotic disorders than men.[13, 14] In recent years, increased numbers of women have been permitted to enlist in the Navy and to be assigned to previously unavailable occupations, including aboard ship. This makes possible comparative studies of mental health and illness by gender as well as the mental health effects of various sociodemographic factors and environmental conditions. The military population also offers unique opportunities to conduct meaningful longitudinal epidemiological investigations. Knowledge of antecedent environmental stresses and interpersonal variables, not now available, that affect the onset and course of neuroses could lead to more effective measures to reduce the substantial burden on medical services represented by neurotic disorders. As the second in a series of investigations of the incidence and outcome of mental disorder in the US Navy, the present study focuses on active-duty men and women diagnosed with a neurotic disorder. The objectives of this study were (1) to determine first hospitalization incidence rates in an initially healthy young adult population by gender, race, and age, and to evaluate the effects of other demographic characteristics on onset and course of illness; and (2) to determine duration of acute illness, severity, and posthospital outcomes in terms of military performance and premature personnel losses. An earlier study in this series evaluated incidence rates for the psychoses in this same population,[15] and future studies will focus on other major categories of mental disorder.

Methods

Sample

For the present study, first hospitalizations for neurotic disorders were extracted from files of medical data maintained by the Naval Health Research Center, San Diego, for all active-duty Navy and Marine Corps personnel. All cases were hospitalized for observation, diagnosis, and evaluation for continued service. Diagnoses were made by attending physicians, often psychiatrists. More severe cases were referred to Medical Boards and Physical Evaluation Boards to determine fitness for duty and degree of disability, respectively. All information used was from official personnel and medical files. Data were edited by checking the internal consistency of multiple records.

Neurotic disorders were defined using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM).[16] This is the diagnostic nomenclature used by the Department of Defense for classification of mental disorders which is essentially the same as the American Psychiatric Association's (APA) Diagnostic and Statistical Manual (DSM),[16] adapted for military use. Neurotic disorders are described in the Glossary of Mental Disorders in ICD-9-CM as follows:

> mental disorders without any demonstrable organic basis in which the individual may have considerable insight and has unimpaired reality testing, in that he usually does not confuse his morbid subjective experiences and fantasies with external reality. Behavior may be greatly affected although usually remaining within socially accepted limits, but personality is not disorganized. The principal manifestations include excessive anxiety, hysterical symptoms, phobias, obsessional and compulsive symptoms, and depression.

Neurotic disorder subtypes were formed using the grouping of disorders given in ICD-9-CM. Three subtypes, the Anxiety group, Hysteria group, and Phobia group, consisted of several categories combined. Obsessive-Compulsive Disorder and Neurotic Depression were based on single diagnostic codes. A final grouping consisting of remaining minor categories and Neurotic Disorders Not Otherwise Specified (Other/NOS) was formed. (See Table I for complete list of diagnostics categories.) Descriptions of the specified neurotic disorder groups, provided in the Glossary of Mental Disorders, ICD-9-CM are as follows:

1. Anxiety states--various combinations of physical and mental manifestations of anxiety, not attributable to real danger and occurring in attacks or as a persisting state. The anxiety is usually diffuse and may extend to panic.
2. Hysteria--A neurotic mental disorder in which motives, of which the patient seems unaware, produce either a restriction of the field of consciousness or disturbances of motor or sensory function, which may seem to have psychological advantage or symbolic value. There are three subtypes: conversion type, dissociative type, and factitious illness.
3. Phobic disorders--Neurotic states with abnormally intense dread of certain objects or situations that would not normally have that effect.
4. Obsessive-Compulsive--States in which the outstanding symptom is a feeling of subjective compulsion, which must be resisted, to carry out some action or dwell on an idea, to recall an experience or to ruminate on an abstract topic. Unwanted thoughts which intrude, the insistence of words or ideas, ruminations or trains of thought are perceived by the individual to be inappropriate or nonsensical. The obsessional urge or idea is recognized as alien to the personality but as coming from within the self. Obsessional actions may be quasi-ritual performances designed to relieve anxiety, (e.g., washing the hands to cope with contamination). Attempts to dispel the unwelcome thoughts or urges may lead to a severe inner struggle, with intense anxiety.
5. Depression--A neurotic disorder characterized by disproportionate depression that has usually recognizably ensued on a distressing experience. It does not include among its features delusions or hallucinations, and there is often preoccupation with the psychic trauma that preceded the illness, e.g., loss of a cherished person or possession. Anxiety is also frequently present. The distinction between depressive neurosis and psychosis should be made upon the degree of depression and the degree of disturbance of the individual's behavior.
6. Other/NOS—Undifferentiated neuroses and miscellaneous minor subtypes

The method of selection of cases for the preceding groups was as follows: first hospitalizations (new cases) for each diagnostic category or individual code were selected for

active-duty Navy enlisted personnel during the period 1980-1988. This period was chosen because it represented a period of stability in ICD-9 and DSM III classification and because the medical record database was known to be complete through this and the follow-up period. All cases were then combined to form the subtype. The composition of neurotic groups in terms of individual ICD-9-CM codes and the numbers of cases (first hospitalizations) are shown in Table I. In addition, all neurotic cases were combined to form a total neurotic group for comparison with a control group, which was randomly drawn from active-duty personnel who served during 1980-1988 but were never hospitalized for a mental disorder.

Measures

Sets of measures were obtained at the time of entry into service or the beginning of the observation period, at the time of hospitalization, and at the time of separation from the service. A mental aptitude score was derived from General Classification Test scores or Armed Forces Qualification Test scores by converting to percentile scores and grouping into five categories. Measures at the time of hospitalization included days hospitalized, type of disposition from the hospital, and assessment by the attending physician as to whether the condition existed prior to entering service (EPTES). Measures at time of discharge included number of hospitalizations during service, Medical Boards, Physical Evaluation Boards, unauthorized absences, desertions, promotions, demotions, recommendations for reenlistment at the time of discharge, early attrition, and remaining in the Navy after 1992, providing at least 4 years of follow-up for all cases. The early attrition measure was a dichotomy based on whether the individual completed obligated service. If the individual was separated from the Navy for any reason before his or her term of enlistment expired, he or she was classified as early or premature attrition. The only exceptions were recommendation for officer training or status and leaving the service within 3 months of expiration of enlistment to attend school. Reasons for attrition included medical disability, misconduct, unsuitability, and convenience of the government.

Data Analysis

The Epidemiological Interactive System (EPISYS) contains hospitalization, demographic, occupational, and military duty assignment records for all Navy enlisted personnel on active duty between 1 January 1980 and 30 September 1994. This computerized program permits rapid access and analysis of epidemiological data. Hospitalization data are obtained from the Naval Medical Information Management Center, Bethesda, MD, and demographic,

occupational, and service history information is provided by the Naval Military Personnel Command in Washington, DC. EPISYS uses person-years as denominators and first hospitalizations for computing incidence rates; it has been described in detail in a recent technical report.[18] Confidence intervals were calculated using the Poisson distribution as described elsewhere.[19] Follow-up analyses were conducted using SPSS Statistical Data Analysis software.[20] Chi-square tests of significance evaluated gender differences at entry into service and time of hospitalization as well as differences between cases and controls and neurotic subtypes at time of discharge.

Results

The number of first hospitalization cases of neurosis during the 1980-1988 period was 5,935. The largest number of cases was Other/NOS. This combined and largely undifferentiated general category (N = 2,595, incidence rate = 58/100,000) was followed by Neurotic Depression (N = 1,229, 27/100,000), Anxiety group (N = 981, 22/100,000), Hysteria group (N = 766, 17/100,000), Phobia group (N = 249, 6/100,000), and Obsessive-Compulsive Disorder (N = 115, 3/100,000) (Table I).

Neurotics Versus Controls

Demographic and other characteristics of the total neurotic group and the control group are shown in Table II. Composition by gender was as follows: Controls, 91% males and 9% females; neurotics, 85% males and 15% females. Cases were somewhat older and less likely to have completed high school than controls. There were no significant differences in paygrade or mental group scores at the beginning of the observation period.

There were gender differences for almost all comparisons of neurotics and controls. Males tended to be younger but had higher paygrades for both neurotics and controls. Women were more often high school graduates for both groups. Female controls had better mental group scores than male controls. These education and mental group differences, which are the result of different enlistment practices for men and women, tend to favor women with respect to completing obligated service successfully.

Table III summarizes characteristics of the total neurotic group at the time of hospitalization, including gender differences. Of neurotic cases, 46% had served 1 year or less at the time of hospitalization, and 15% were recruits. A large proportion (71%) was in their first enlistment, and 73% had enlisted for 4-year terms. A large number were given more than one

diagnosis during hospitalization (74%); 61% of the neurotic diagnoses were primary diagnoses. Two thirds of the neurotics were assigned directly to duty stations at discharge from the hospital. For 17% of the patients, the examining physician stated that the condition was EPTES. Most cases (54%) were hospitalized for 5 days or less.

As to gender differences at hospitalization, women had fewer years of service and were less often petty officers. Women more often were in their first enlistments and had 4-year terms of enlistment than men. Women had shorter hospitalizations than men. No differences existed with respect to condition EPTES, number of diagnoses, or type of diagnosis (primary).

Table IV compares characteristics of neurotic and control groups at the time of discharge. Differences between the groups were significant at $p < .0001$ for all variables. Neurotics had shorter lengths of service and were less often petty officers than controls. Controls had more promotions and fewer demotions than neurotics. Neurotics had many more hospitalizations and more Medical Boards and Physical Evaluation Boards than controls. Neurotics were more likely to be married or divorced/separated than controls.

Three outcome indicators were compared for neurotics and controls: early attrition (separation before completion of obligated service), recommendation for reenlistment at the time of discharge, and remaining in the service after the follow-up period (after 1992). Differences for the first two indicators are shown in Tables V and VI, by age, education, and mental group. Neurotics were much more likely to be separated from the Navy prematurely than controls (72% vs. 39%) and much more often not recommended for reenlistment than controls. High school graduation strongly affected outcome for controls and less so, but also significantly for, neurotics. Age affected early attrition for neurotics but not for controls, while mental group (aptitude score) significantly affected controls but not neurotics. On the third indicator neurotics less often remained in service after 1992 (11% vs. 23%, $X^2_1 = 387$, $p < .0001$).

Incidence Rates by Sex, Race, and Age

Incidence rates for each neurotic disorder subgroup by sex, race, and age are shown in Tables VII to XII. For the Anxiety group, the incidence rate was higher for women than men. The rate for white men was higher than that for black men and the rate for white women was higher than that for black women (Table VII). The rates for Other men and women were higher than those for blacks; however, the number of Other women was too small for a meaningful estimate.

Incidence rates for the Hysteria group were twice as high for women than men (Table VIII). In all three racial subgroups cases tended to be young. The Other racial subgroup of men had lower rates than white or black men, but rates among racial subgroups of women were similar. Generally, the incidence of Phobic disorders was low in the naval population, and the incidence of these disorders did not vary significantly by gender, race, or age (Table IX).

The incidence rate for Neurotic Depression was also much higher in females than males (Table X). White men and women had more than double the rate of black men and women, and Others had rates between the two. For both black and white subgroups, there were higher rates among younger personnel and no female cases over 40 years of age.

There were relatively few Obsessive-Compulsive cases, and 83% of these were white males (Table XI). This was the only neurotic group that did not clearly have younger cases, but differences in age distributions were not significant because of the small number of cases. The undifferentiated Other/NOS group had a much higher incidence rate for women than men and a higher rate for white males than black males or Other subgroups (Table XII). White females also had a higher rate than black females but not for Other females. All male racial subgroups had higher rates for younger personnel with a slight subsequent increase in the over 45 year age group. Among all racial subgroups of women, the highest incidence rates were in the 17-19 year old age range. There were no female cases over age 45.

Differences among Neurotic Groups at Accession, Hospitalization, and Discharge or Follow-up

Differences among neurotic groups at accession are shown in Table XIII. The Hysteria and Depressive groups had the highest proportion of women while the Obsessive-Compulsive group had the highest proportion of men. Hysteria and Other/NOS cases tended to be younger than other groups; Obsessive-Compulsive cases tended to be older, that is age 25 and above, than other groups. The Hysteria and Other/NOS groups had more non-high school graduates than other groups, and Obsessive-Compulsive cases had better mental aptitude scores than other groups.

At the time of hospitalization, as seen in Table XIV, the Hysteria group had lower paygrades and a shorter time in service than other groups, while Obsessive-Compulsive cases had higher paygrades and longer service. Hysteria cases were more often in their first enlistments, while Obsessive-Compulsive cases were less often in first enlistments. Depression

was more often a primary diagnosis while Obsessive-Compulsive was less often so. Obsessive-Compulsive cases were more likely to have a single diagnosis than other groups, while Other/NOS cases were more likely to have multiple diagnoses. Phobia cases were much more likely to be discharged from the hospital to a Holding Company rather than directly to a ship or shore station; conversely, Other/NOS cases were very likely to be directly assigned to a duty station. Phobic cases were much more likely to be judged to have had their condition EPTES than other groups; the Other/NOS group was least likely to be so considered. The Depressive group had the most days hospitalized and the Other/NOS group had the least.

Comparisons of neurotic groups at the time of discharge from service or the end of follow-up revealed significant differences on all variables (Table XV). The Other/NOS group was most likely to be single and the Obsessive-Compulsive group least likely. The Anxiety group had the highest divorced/separated rate but differences were small. The Phobia group had the shortest length of service at discharge while Obsessive-Compulsives had the longest. The Obsessive-Compulsive cases had the highest paygrades, and the Hysteria and Other/NOS groups the lowest. The Phobia group had the fewest hospitalizations during their careers but the most Medical and Physical Evaluation Boards. The Other/NOS group had the fewest board referrals. The Obsessive-Compulsive group had the most promotions and the Phobia group the least. The Phobia group also had the fewest demotions. The Other/NOS group had the most demotions. The Hysteria group had the most unauthorized absences. The Obsessive-Compulsive group had the fewest desertions. The Phobia group had the highest premature attrition rate and the Obsessive-Compulsive group had the lowest. The Phobia and Hysteria groups had the highest rates of negative recommendations for reenlistment. The Phobia and Depressive groups had the lowest percentages remaining in service after 1992; the Anxiety group had the highest.

In terms of the set of severity/duration indicators shown in Table XVI, the Phobia and Depressive groups had the poorest prognoses for continued service, and the Other/NOS and Anxiety groups had the best prognoses. On the early attrition indicator alone, the Obsessive-Compulsive group was lowest, reflecting the fact that this group was older, had longer service, and higher paygrades than other groups at the time of hospitalization.

Changes in Incidence Rates Over Time

Incidence rates generally were stable over the specified observation period. The only exception was the Other/NOS group, which more than tripled in rate from 1980 to 1988. This

undifferentiated category reflected uncertainty with respect to the specific nature of the disorder. It is unclear why such an increase should occur, but perhaps it was related to the fact that these cases were younger than patients in other groups.

Discussion

This study examined a number of aspects of hospitalization for neurosis in the naval service: preservice demographic and personal history characteristics that differentiated neurotics from controls; differences among types of neuroses at the time of entry into service and hospitalization; differences in outcome between neurotics and controls and among types of neurosis; gender, race, and age differences in incidence by type of neurosis; and changes in incidence rates over time.

Neurotic and control groups did not differ on mental aptitude at the time of entry into service. Thus, this variable is of no value for screening at entry. Early studies of psychiatric morbidity in the military environment "have established that the majority of psychiatric illnesses are seen as failure in adaptation, and associated with current acute or chronic stress,"[7 (pg.51)] but that the more severe stresses of active service are responsible for precipitating only a minority of the neurotic disabilities. In a rare prospective study, it was found that self-perceived and professionally assessed mental health problems with maladjustment in the family, as well as treatment with psychoactive drugs, predicted subsequent admission for anxiety and depressive neurosis among more than 50,000 young Swedish men conscripted for compulsory military training.[21] Given the 17% of hospitalized neurotics judged to have been symptomatic EPTES in the present study, it may be suggested that improved mental health screening could help reduce a substantial amount of the manpower losses and costs associated with such illnesses in the military.

Neurotics were disproportionately female. This gender difference was pronounced for all neurotic subgroups except Phobic and Obsessive-Compulsive. Both neurotics and controls showed similar gender differences in age, paygrade, and education. Female controls were older, more often high school graduates, and had higher aptitude scores than male controls; however, females were in lower paygrades at the beginning of the observation period because males typically had served longer. Female neurotics showed a similar pattern of preservice characteristics.

Considerable variation in the incidence, demographic composition, and outcomes of neurotic subtypes was found. Overall incidence ranged from a low of 3 per 100,000 for Obsessive-Compulsive disorders to a high of 58 per 100,00 for Other/NOS. Other racial group females had both the low rate for phobias of less than 1 per 100,000 and the highest rates for Other/NOS of 110 per 100,000. Whereas Other racial group women tended to have higher rates than black women for diagnoses of hysteria and Other/NOS, no such pattern was apparent among black and Other men, suggesting there may be more diagnostic uncertainty in this smaller group of women.

Neurotics tended to be hospitalized early in their careers and typically had short hospital stays (54%, 0–5 days). However, a large proportion of those hospitalized for neuroses were prematurely separated from the service (72% vs. 39% for controls). The Phobia group had the highest attrition and rate of negative recommendation for reenlistment, followed by the Hysteria and Depression groups. The groups with the best prognosis were the Other/NOS and Anxiety groups. This result appears somewhat surprising in view of the generally favorable prognosis for these conditions in clinical practice, yet is consistent with findings from a Swedish longitudinal study of child and adolescent psychiatric patients, which noted that only 33% of the 64 men who had been cared for by child and adolescent psychiatry completed their national military service.[22] The others were exempt from service, half of them after having begun training. It may be that only the most severe cases of neurosis are so diagnosed in the present population while less severe cases involving acute anxiety or depression are diagnosed Acute Reaction to Stress, Adjustment Reaction, or Conduct Disorder. On the other hand, Anthony reported that after World War II, "a large proportion of discharges for psychoneuroses had been brought about because of difficulties experienced by line officers in effecting the administrative discharges of inadequates and of persons inadaptable to the service."[7 (pg.45)]

Diagnosing neurosis in the military has been notoriously unreliable. In a review of the pre-1970s literature, Anthony[7] noted the common and imprecise use of such terms as "war neuroses" (not included in either APA's DSM or the ICD-9-CM) to designate a wide variety of abnormal reactions occurring in military personnel in wartime. The term psychoneurosis had also been widely misapplied and represented not so much an illness as a failure to adapt to military routine and discipline.[7] In 1966, Arthur and Gunderson[23, 24] found that changes in diagnoses were attributable to a combination of patient characteristics and administrative and disposition

policies, rather than changes in the clinical status of patients. In the same year, a policy change in military psychiatric nomenclature restricted the use of the generic term "psychoneurosis" to the point where the diagnosis became "practically nonexistent in the American forces."[7(pg. 45)] In a study of diagnostic agreement of enlisted Navy personnel hospitalized between 1980 and 1984 with a "mental problem", diagnostic subtypes were found to be less reliable than diagnostic type or group and suggested that "in actual practice a 'close enough principle' steers most clinical diagnoses, and is probably the general rule regardless of the classification system or range of diagnostic types examined."[25 (pg. 14)] The extensive use of the ICD-9-CM code for Neurotic Disorder NOS found in the present study, it's increase over time, and the associated high rate of attrition may point to continuing difficulties effecting administrative discharges of unsuitable personnel. This may, in turn, inhibit clear understanding and evaluation of both the clinical and administrative issues of true, clinically based mental illness in the military.

A diagnosis is meaningful if it reflects severity, duration, specific types of disability that ensue, and response to treatment. If the diagnostic scheme does not differentiate with respect to those criteria, it would appear to have little utility. It should be recognized that diagnosis is probabilistic in nature, that is, it should allow for uncertainty in assigning mental disorder categories. In the present use of the ICD-9-CM diagnostic system, uncertainty can be expressed in a number of ways: (1) more than one diagnostic code can be assigned at the time of initial hospitalization (usually categories within the same major diagnostic types), (2) the diagnosis can change if the individual is rehospitalized or evaluated by a Medical Board/Physical Evaluation Board, and (3) the diagnosis given can indicate NOS or not elsewhere classified. In the present study, such uncertainty was associated with less severity but average risk for continued service.

Differentiation into broad major categories such as psychoses and neuroses, which are associated with reliable differences in outcome, is a first important step in developing a useful diagnostic scheme. (This distinction often involves the need for hospitalization or not.) Differentiating among specific types of psychosis or neurosis also are important steps, but again, this process must allow for uncertainty. This stage of developing an effective classification system involves formulating rules for combining and evaluating available clinical information (ie, symptom and behavior patterns). The specification of increasingly explicit rules for distinguishing diagnostic categories and clinical phenomena in psychiatry has enabled their inclusion within computer-based reasoning systems called "expert" systems.[26] Also, the recent

collaborative development of ICD-10 with DSM IV has aligned these two newest generation diagnostic coding systems more closely.[27] Adherence to these coding schemes within the military medical community, in conjunction with computer-assisted diagnostic systems, would improve diagnostic classification, permit important comparative studies, and help increase our understanding of the etiology, treatment, and outcome of neurotic disorders.

Key issues for future research are determining who should be treated and what treatment methods should be applied to specific disorders. In the civilian sector, recently reported high prevalence rates of psychiatric disorders in the general population have raised concerns about cost-benefit consequences of what might be seen as "a bottomless pit of possible demand for mental health services."[28] Even from the comparatively low incidence of hospitalizations for mental disorders reported in the current series of studies, it seems clear that not all persons in the Navy identified as having significant emotional and behavioral problems can be treated. Therefore, it must be determined (1) what criteria establish the necessity of hospitalization rather than outpatient treatment, (2) what criteria should be used to select treatable cases, and (3) what kinds of treatment can be applied effectively. Of particular interest would be further study to determine if outpatient referral, consultation, and therapeutic support could be as effective as hospitalization in management of selected neurotic patients. Further, from clinical experience and previous research we could expect that there are large differences among broad diagnostic categories in prognosis. In fact, previous research on outcomes in the Navy population has established a hierarchy of outcomes from poorest to best, as follows: psychoses, personality disorders, neuroses, acute stress or adjustment reactions, and psychophysiological disorders.[7] Such research represents a modest beginning in obtaining quantitative estimates of outcomes based on longitudinal epidemiological investigations. Such studies, though rare, are also much needed to differentiate more severe from less severe conditions and perhaps to devise new strategies for identification, classification, referral, and management of neurotic disorders.

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TABLE I

NUMBERS OF CASES AND INCIDENCE RATES FOR NEUROTIC DISORDER GROUPS (ICD-9-CM)

		No. of Cases	Incidence Rate
Anxiety states group			
30000	Anxiety states	839	
30001*	Panic disorder	83	
30002*	Generalized anxiety disorder	53	
30009*	Anxiety state not elsewhere classified	6	
	Total Anxiety Group	981	21.94**
Hysteria group			
30010	Hysteria	523	
30011*	Conversion disorder	117	
30012*	Psychogenic amnesia	46	
30013*	Psychogenic fugue	3	
30014*	Multiple personality	27	
30015*	Dissociative reaction not otherwise specified	44	
30016*	Factitious illness with symptoms	2	
30019*	Factitious illness not elsewhere classified/not otherwise specified	2	
	Total Hysteria Group	766	17.09
Phobia group			
30020	Phobic disorders	154	
30021*	Agoraphobia with panic	14	
30022*	Agoraphobia without panic	6	
30023*	Social phobia	9	
30029*	Isolated phobias not elsewhere classified	66	
	Total Phobia Group	249	5.57
30030	Obsessive-compulsive disorder	115	2.57
30040	Neurotic depression	1229	27.49
Other Neurotic Disorders/Neurotic Disorders Not Otherwise Specified			
30050	Neurasthenia	9	
30060	Depersonalization syndrome	9	
30070	Hypochondriasis	23	
30080	Neurotic disorders not elsewhere classified	47	
30081*	Somatization disorder	28	
30089*	Neurotic disorders not elsewhere classified	5	
30090	Neurotic disorders not otherwise specified	2473	
	Total Other/NOS	2595	58.03

*These specific diagnoses were only coded after 1985, that is, after ICD-9-CM was adopted by the Department of Defense. However, the total number of new cases per year for the various groups tended to remain stable.

**The number of new cases per 100,000 person-years.

TABLE II

CHARACTERISTICS OF NEUROTIC AND CONTROL GROUPS AND SEX DIFFERENCES AT BEGINNING OF OBSERVATION PERIOD OR ENTRY INTO SERVICE

	Neurotics				
	Male	Female		Total	
	%	%	X^2.p	n	%
Age,y					
<19	44.2	31.5		2512	42.4
19-20	30.4	30.3	73.2 < .001	1804	30.4
>20	25.3	38.2		1615	27.2
Paygrade					
E1	67.5	74.6	17.6 < .001	4067	68.5
> E1	32.5	25.4		1868	31.5
Education					
8-11	21.9	8.0	89.7 < .001	1176	19.9
> 11	78.1	92.0		4745	80.1
Mental group*					
1-2	37.4	39.3		1902	37.5
3	28.8	35.5	4.0 ns	1469	28.9
4-5	33.8	25.2		1706	33.6
			Controls		
Age, y					
<19	46.5	34.1		5285	45.4
19-20	31.3	32.6	84.9, < .001	3650	31.4
>20	22.2	33.3		2699	23.2
Paygrade					
E1	68.7	76.1	25.5, < .001	8069	69.4
> E1	31.3	23.9		3565	30.6
Education					
8-11	16.5	5.0	98.4, < .001	1789	15.4
> 11	83.5	95.0		9826	84.6
Mental group*					
1-2	37.7	43.4		3951	37.8
3	27.8	36.4	13.2, < .001	2926	28.0
4-5	34.5	20.3		3589	34.3

*Lower scores indicate better mental aptitude.

TABLE III

CHARACTERISTICS OF NEUROTIC GROUP AND SEX DIFFERENCES AT TIME HOSPITALIZED

	n	%	Sex Differences p<.01
Paygrade			
E1	868	15.4	Female
E2 – E3	2334	41.3	Fewer Petty Officers
E4 – E6 (Petty Officer)	2447	43.3	
Length of service, y			
0 – 1	2706	45.6	Female
2 – 6	1902	32.0	Fewer years
> 6	1327	22.4	
Term enlistment, y			
4	4015	72.7	Female
Other	1509	27.3	More with 4 years
Number of enlistments			
1	4055	70.6	More female
>1	1691	29.4	first enlistment
Type of diagnosis			
Primary	3632	61.2	None
Other	2303	38.8	
Number of diagnoses			
1	1526	25.7	
2	2193	37.0	None
3 – 8	2216	37.3	
Type hospital discharge			
Direct	3988	67.3	More males
Holding Company	1083	18.3	Holding Company
Other/Died	856	14.4	
EPTES			
Yes	1007	17.1	None
No	4865	82.9	
Days hospitalized			
0 – 5	3181	53.6	
6 – 20	1892	31.9	Female fewer days
>20	862	14.5	

TABLE IV

CHARACTERISTICS OF NEUROTIC AND CONTROL GROUPS AT TIME OF DISCHARGE OR FOLLOW-UP*

	Neurotics		Controls	
	n	%	n	%
Age				
17 – 24	3025	57.1	5561	62.1
25 – 34	1588	30.0	2325	25.9
> 34	685	12.9	1074	12.0
Length of service*, Y				
0 – 2	2368	44.7	2556	28.5
3 – 6	1518	28.6	4382	48.9
> 6	1416	26.7	2029	22.6
Paygrade				
E1	1047	19.7	1598	17.8
E2 – E3	1823	34.4	2151	24.0
> E3	2432	45.9	5217	58.2
Promotions				
0	1005	19.0	1338	14.9
1 – 2	2267	42.8	3151	35.1
> 2	2030	38.3	4478	49.9
Demotions				
0	3884	73.3	6873	76.6
>0	1418	26.7	2094	23.4
Total no. hospitalizations				
1	2155	40.6	1363	60.8
2 – 3	2076	39.2	684	38.5
> 3	1071	20.2	195	8.7
Medical boards				
0	4479	84.5	8596	95.9
1 – 5	823	15.5	371	4.1
Physical evaluation board				
0	4908	92.6	8801	98.1
1 – 3	394	7.4	166	1.9
Marital status				
Single	2196	44.4	4370	52.4
Married	2270	45.9	3383	40.5
Divorced/separated	480	9.7	594	7.1
Recommended reenlist.				
Yes	757	14.9	3922	45.5
No	2471	48.7	2476	28.7
Disability	1226	24.1	431	5.0
Other	624	12.3	1794	20.8
Early attrition				
Yes	3836	72.4	3476	38.8
No	1466	27.6	5491	61.2

* Differences between neurotics and controls significant at p<.0001 on all variables.

TABLE V

RELATIONSHIPS OF AGE, EDUCATION, AND MENTAL GROUP TO EARLY ATTRITION FOR NEUROTICS AND CONTROLS

	Neurotics					Controls				
	Early Attrition					Early Attrition				
	No		Yes		χ^2	No		Yes		χ^2
Age, Y*	n	%	n	%	*p*	n	%	n	%	*p*
< 19	652	29.1	1587	70.9		2563	61.2	1625	38.8	
19 - 20	458	28.4	1153	71.6	9.7	1761	62.7	1047	37.3	
> 20	356	24.6	1092	75.4	<.05	1164	59.3	800	40.7	ns
Education										
8 - 11	266	25.0	800	75.0	4.7	735	47.7	805	52.3	
> 11	1194	28.3	3028	71.7	<.05	4747	64.1	2663	35.9	<.001
Mental group*										
1 - 2	492	28.7	1221	71.3		1936	64.4	1069	35.6	
3	335	25.7	968	74.3		1386	61.4	873	38.6	
4 - 5	433	28.7	1077	71.3	ns	1672	59.7	1130	40.3	<.001

*At time of entry into service.

**Lower scores indicate better mental aptitude.

TABLE VI

COMPARISONS OF NEUROTICS AND CONTROLS ON RECOMMENDATION FOR REENLISTMENT

	Neurotics								
	Yes		No		Disability		Other		X^2
	n	%	n	%	n	%	n	%	*p*
Age, Y*									
< 19	348	16.3	1065	49.8	444	20.6	286	13.4	35.7
19 - 20	216	14.0	758	49.1	382	24.7	188	12.2	
> 20	193	13.9	644	46.4	402	28.9	150	10.8	<.001
Education									
8 - 11	115	11.6	612	61.9	184	18.6	77	7.8	89.1
> 11	641	15.7	1852	45.4	1039	25.5	545	13.4	<.001
Mental Group**									
1 - 2	269	16.4	729	44.4	431	26.3	212	12.9	
3	159	12.8	659	53.0	293	23.6	133	10.7	30.4
4 - 5	178	12.4	741	51.8	331	23.1	180	12.6	<.001
				Controls					
Age, Y*									
< 19	1836	45.6	1197	29.8	167	4.2	823	20.5	23.6, <.001
19 - 20	1260	46.8	747	27.7	138	5.1	548	20.3	
> 20	823	43.3	532	28.0	126	6.6	419	22.1	
Education									
8 - 11	468	32.2	712	49.0	58	4.0	216	14.9	352.0, <.001
> 11	3447	48.2	1758	24.6	372	5.2	1576	22.0	
Mental group**									
1 – 2	1448	50.0	697	24.1	154	5.3	596	20.6	71.9, <.001
3	958	44.3	701	32.4	92	4.3	411	19.0	
4 - 5	1132	42.0	890	33.0	138	5.1	535	19.9	

*At time of entry into service.

**Lower scores indicate better mental aptitude.

TABLE VII

INCIDENCE RATES FOR ANXIETY DISORDERS BY SEX, RACE, AND AGE

	Age	No. of	Person-Years	Incidence	Confidence Intervals+	
Male	Group	Cases	At Risk	Rate	Lower	Upper
White	17-19	104	376106	27.65	22.33	32.96
	20-21	140	619087	22.61	18.87	26.35
	22-24	134	697799	19.20	15.95	22.45
	25-29	142	655557	21.66	18.10	25.22
	30-34	99	415992	23.80	19.11	28.48
	35-39	80	291920	27.40	21.40	33.40
	40-44	22	113959	19.31	11.25	27.32
	45-61	6	35836	16.74	3.49	29.91
	Total	727	3206256	22.67	21.03	24.32
Black	17-19	11	70912	15.51	6.39	24.58
	20-21	16	118310	13.52	6.91	20.10
	22-24	15	134894	11.12	5.51	16.70
	25-29	17	134684	12.62	6.63	18.58
	30-34	5	72684	6.88	0.93	12.79
	35-39	5	36947	13.53	1.83	25.16
	40-44	3	12184	24.62	0.00	49.24
	45-61	1	3207	31.18	0.00	62.36
	Total	73	583822	12.50	9.63	15.36
Other	17-19	1	14798	6.76	0.00	13.52
	20-21	8	26429	30.27	9.44	50.96
	22-24	5	36322	13.77	1.87	25.59
	25-29	9	58583	15.36	5.39	25.28
	30-34	6	54920	10.93	2.28	19.52
	35-39	6	49587	12.10	2.52	21.62
	40-44	4	27671	14.46	0.55	28.29
	45-61	4	8164	48.99	1.85	95.88
	Total	43	276474	15.55	10.90	20.18
	Total	843	4066552	20.73	19.33	22.13
Female						
White	17-19	14	33657	41.60	19.87	63.19
	20-21	22	57682	38.14	22.22	53.98
	22-24	26	72020	36.10	22.23	49.90
	25-29	29	70915	40.89	26.02	55.70
	30-34	11	37615	29.24	12.04	46.34
	35-39	6	16868	35.57	7.41	63.55
	40-44	2	4793	41.72	0.00	83.45
	45-61	0	1339	0.00	0.00	0.00
	Total	110	294890	37.30	30.33	44.26

+95% confidence intervals.

TABLE VII (CONT'D)

INCIDENCE RATES FOR ANXIETY DISORDERS BY SEX, RACE, AND AGE

Female	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
Black	17-19	5	10104	49.48	6.70	92.00
	20-21	6	17518	34.25	7.14	61.19
	22-24	6	23541	25.49	5.31	45.53
	25-29	1	24495	4.08	0.00	8.17
	30-34	3	11611	25.84	0.00	51.67
	Total	21	92663	22.66	12.98	32.29
Other	Total	7	16388	42.72	11.35	73.88
Total	Female	138	403940	34.16	28.46	39.85
Total	Enlisted	981	4470493	21.94	20.57	23.32

+95% confidence intervals.

TABLE VIII

INCIDENCE RATES FOR HYSTERIA BY SEX, RACE, AND AGE

Male	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
White	17-19	136	376106	36.16	30.08	42.23
	20-21	113	619087	18.25	14.89	21.61
	22-24	115	697799	16.48	13.47	19.49
	25-29	74	655557	11.29	8.72	13.85
	30-34	39	415992	9.38	6.43	12.31
	35-39	25	291920	8.56	5.21	11.90
	40-44	9	113959	7.90	2.77	12.99
	45-61	1	35836	2.79	0.00	5.58
	Total	512	3206256	15.97	14.59	17.35
Black	17-19	28	70912	39.49	24.87	54.03
	20-21	26	118310	21.98	13.54	30.38
	22-24	15	134894	11.12	5.51	16.70
	25-29	21	134684	15.59	8.93	22.22
	30-34	5	72684	6.88	0.93	12.79
	35-39	1	36947	2.71	0.00	5.41
	40-44	0	12184	0.00	0.00	0.00
	45-61	0	3207	0.00	0.00	0.00
	Total	96	583822	16.44	13.15	19.73
Other	17-19	3	14798	20.27	0.00	40.55
	20-21	4	26429	15.13	0.57	29.62
	22-24	2	36322	5.51	0.00	11.01
	25-29	4	58583	6.83	0.26	13.36
	30-34	3	54920	5.46	0.00	10.93
	35-39	3	49587	6.05	0.00	12.10
	40-44	0	27671	0.00	0.00	0.00
	45-61	1	8164	12.25	0.00	24.50
	Total	20	276474	7.23	4.07	10.38
Total	Male	628	4066552	15.44	14.23	16.65
Female						
White	17-19	20	33657	59.42	33.42	85.29
	20-21	30	57682	52.01	33.41	70.53
	22-24	20	72020	27.77	15.62	39.86
	25-29	20	70915	28.20	15.86	40.48
	30-34	9	37615	23.93	8.39	39.37
	35-39	2	16868	11.86	0.00	23.71
	40-44	0	4793	0.00	0.00	0.00
	45-61	1	1339	74.68	0.00	149.37
	Total	102	294890	34.59	27.87	41.29

+95% confidence intervals.

TABLE VIII (CONT'D)

INCIDENCE RATES FOR HYSTERIA BY SEX, RACE, AND AGE

Female	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
Black	17-19	10	10104	98.97	37.94	159.60
	20-21	8	17518	45.67	14.25	76.88
	22-24	4	23541	16.99	0.64	33.25
	25-29	4	24495	16.33	0.62	31.96
	30-34	2	11611	17.22	0.00	34.45
	35-39	1	4242	23.57	0.00	47.15
	Total	29	92663	31.30	19.91	42.63
Other	Total	5	16388	30.51	4.13	56.73
Total	Female	136	403940	33.67	28.01	39.32
Total	Enlisted	764	4470493	17.09	15.88	18.30

+95% confidence intervals.

TABLE IX

INCIDENCE RATES FOR PHOBIAS BY SEX, RACE, AND AGE

	Age	No. of	Person-Years	Incidence	Confidence Intervals+	
Male	Group	Cases	At Risk	Rate	Lower	Upper
White	17-19	34	376106	9.04	6.00	12.06
	20-21	42	619087	6.78	4.73	8.83
	22-24	36	697799	5.16	3.47	6.84
	25-29	29	655557	4.42	2.81	6.03
	30-34	25	415992	6.01	3.66	8.35
	35-39	21	291920	7.19	4.12	10.25
	40-44	3	113959	2.63	0.00	5.27
	45-61	1	35836	2.79	0.00	5.58
	Total	191	3206256	5.96	5.11	6.80
Black	17-19	4	70912	5.64	0.21	11.04
	20-21	6	118310	5.07	1.06	9.06
	22-24	8	134894	5.93	1.85	9.98
	25-29	8	134684	5.94	1.85	10.00
	30-34	0	72684	0.00	0.00	0.00
	35-39	1	36947	2.71	0.00	5.41
	40-44	0	12184	0.00	0.00	0.00
	45-61	0	3207	0.00	0.00	0.00
	Total	27	583822	4.62	2.88	6.36
Other	17-19	2	14798	13.52	0.00	27.03
	20-21	1	26429	3.78	0.00	7.57
	22-24	0	36322	0.00	0.00	0.00
	25-29	1	58583	1.71	0.00	3.41
	30-34	3	54920	5.46	0.00	10.93
	35-39	3	49587	6.05	0.00	12.10
	40-44	0	27671	0.00	0.00	0.00
	45-61	0	8164	0.00	0.00	0.00
	Total	10	276474	3.62	1.39	5.83
Total	Male	228	4066552	5.61	4.88	6.33
Female						
White	17-19	2	33657	5.94	0.00	11.88
	20-21	3	57682	5.20	0.00	10.40
	22-24	6	72020	8.33	1.74	14.88
	25-29	4	70915	5.64	0.21	11.04
	30-34	3	37615	7.98	0.00	15.95
	35-39	0	16868	0.00	0.00	0.00
	40-44	1	4793	20.86	0.00	41.72
	45-61	0	1339	0.00	0.00	0.00
	Total	19	294890	6.44	3.55	9.32

+95% confidence intervals.

TABLE IX (CONT'D)

INCIDENCE RATES FOR PHOBIAS BY SEX, RACE, AND AGE

Female	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
Black	17-19	0	10104	0.00	0.00	0.00
	20-21	1	17518	5.71	0.00	11.42
	22-24	0	23541	0.00	0.00	0.00
	25-29	1	24495	4.08	0.00	8.17
	Total	2	92663	2.16	0.00	4.42
Other	Total	0	16388	0.00	0.00	0.00
Total	Female	21	403940	5.20	2.98	7.41
Total	Enlisted	249	4470493	5.57	4.88	6.26

+95% confidence intervals.

TABLE X

INCIDENCE RATES FOR NEUROTIC DEPRESSION BY SEX, RACE, AND AGE

Male	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
White	17-19	172	376106	45.73	38.89	52.56
	20-21	178	619087	28.75	24.53	32.97
	22-24	176	697799	25.22	21.49	28.94
	25-29	170	655557	25.93	22.03	29.82
	30-34	93	415992	22.36	17.81	26.89
	35-39	84	291920	28.78	22.62	34.91
	40-44	25	113959	21.94	13.35	30.49
	45-61	5	35836	13.95	1.89	25.94
	Total	903	3206256	28.16	26.33	30.00
Black	17-19	17	70912	23.97	12.60	35.28
	20-21	12	118310	10.14	4.43	15.82
	22-24	15	134894	11.12	5.51	16.70
	25-29	16	134684	11.88	6.07	17.65
	30-34	12	72684	16.51	7.20	25.76
	35-39	3	36947	8.12	0.00	16.24
	40-44	3	12184	24.62	0.00	49.24
	45-61	0	3207	0.00	0.00	0.00
	Total	78	583822	13.36	10.39	16.32
Other	17-19	3	14798	20.27	0.00	40.55
	20-21	7	26429	26.49	7.04	45.81
	22-24	9	36322	24.78	8.69	40.77
	25-29	9	58583	15.36	5.39	25.28
	30-34	8	54920	14.57	4.54	24.52
	35-39	3	49587	6.05	0.00	12.10
	40-44	5	27671	18.07	2.45	33.60
	45-61	0	8164	0.00	0.00	0.00
	Total	44	276474	15.91	11.21	20.60
Total	Male	1025	4066552	25.21	23.66	26.75
Female						
White	17-19	26	33657	77.25	47.58	106.78
	20-21	32	57682	55.48	36.26	74.61
	22-24	44	72020	61.09	43.04	79.08
	25-29	40	70915	56.41	38.93	73.82
	30-34	21	37615	55.83	31.98	79.55
	35-39	10	16868	59.28	22.73	95.60
	40-44	0	4793	0.00	0.00	0.00
	45-61	0	1339	0.00	0.00	0.00
	Total	173	294890	58.67	49.92	67.40

+95% confidence intervals.

TABLE X (CONT'D)

INCIDENCE RATES FOR NEUROTIC DEPRESSION BY SEX, RACE, AND AGE

Female	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
Black	17-19	6	10104	59.38	12.37	106.08
	20-21	5	17518	28.54	3.87	53.07
	22-24	3	23541	12.74	0.00	25.49
	25-29	9	24495	36.74	12.88	60.45
	30-34	1	11611	8.61	0.00	17.22
	Total	24	92663	25.90	15.55	36.20
Other	Total	7	16388	42.72	11.35	73.88
Total	Female	204	403940	50.50	43.57	57.42
Total	Enlisted	1229	4470493	27.49	25.95	29.03

+95% confidence intervals.

TABLE XI

INCIDENCE RATES FOR OBSESSIVE-COMPULSIVE DISORDERS BY SEX, RACE, AND AGE

	Age	No. of	Person-Years	Incidence	Confidence Intervals+	
Male	Group	Cases	At Risk	Rate	Lower	Upper
White	17-19	13	376106	3.46	1.58	5.32
	20-21	12	619087	1.94	0.85	3.02
	22-24	15	697799	2.15	1.06	3.23
	25-29	17	655557	2.59	1.36	3.82
	30-34	21	415992	5.05	2.89	7.19
	35-39	10	291920	3.43	1.31	5.52
	40-44	5	113959	4.39	0.59	8.16
	45-61	2	35836	5.58	0.00	11.16
	Total	95	3206256	2.96	2.37	3.56
Black	17-19	0	70912	0.00	0.00	0.00
	20-21	1	118310	0.85	0.00	1.69
	22-24	0	134894	0.00	0.00	0.00
	25-29	1	134684	0.74	0.00	1.48
	30-34	1	72684	1.38	0.00	2.75
	35-39	1	36947	2.71	0.00	5.41
	40-44	0	12184	0.00	0.00	0.00
	45-61	1	3207	31.18	0.00	62.36
	Total	5	583822	0.86	0.12	1.59
Other	17-19	0	14798	0.00	0.00	0.00
	20-21	0	26429	0.00	0.00	0.00
	22-24	0	36322	0.00	0.00	0.00
	25-29	3	58583	5.12	0.00	10.24
	30-34	1	54920	1.82	0.00	3.64
	35-39	1	49587	2.02	0.00	4.03
	40-44	3	27671	10.84	0.00	21.68
	45-61	0	8164	0.00	0.00	0.00
	Total	8	276474	2.89	0.90	4.87
Total	Male	108	4066552	2.66	2.15	3.16
Female						
White	17-19	1	33657	2.97	0.00	5.94
	20-21	1	57682	1.73	0.00	3.47
	22-24	0	72020	0.00	0.00	0.00
	25-29	1	70915	1.41	0.00	2.82
	30-34	0	37615	0.00	0.00	0.00
	35-39	1	16868	5.93	0.00	11.86
	40-44	0	4793	0.00	0.00	0.00
	45-61	0	1339	0.00	0.00	0.00
	Total	4	294890	1.36	0.05	2.65

+95% confidence intervals.

TABLE XI (CONT'D)

INCIDENCE RATES FOR OBSESSIVE-COMPULSIVE DISORDERS BY SEX, RACE, AND AGE

Female	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
Black	Total	2	92663	2.16	0.00	4.32
Other	Total	1	16388	6.10	0.00	12.20
Total	Female	7	403940	1.73	0.46	3.00
Total	Enlisted	115	4470493	2.57	2.10	3.04

+95% confidence intervals.

TABLE XII

INCIDENCE RATES FOR OTHER NEUROTIC DISORDERS/NEUROTIC DISORDERS NOS BY SEX, RACE, AND AGE

	Age	No. of	Person-Years	Incidence	Confidence Intervals+	
Male	Group	Cases	At Risk	Rate	Lower	Upper
White	17-19	453	376106	120.44	109.35	131.53
	20-21	486	619087	78.50	71.52	85.48
	22-24	398	697799	57.04	51.43	62.64
	25-29	316	655557	48.20	42.89	53.51
	30-34	156	415992	37.50	31.61	43.38
	35-39	82	291920	28.09	22.01	34.15
	40-44	16	113959	14.04	7.18	20.86
	45-61	7	35836	19.53	5.19	33.78
	Total	1914	3206256	59.70	57.02	62.37
Black	17-19	42	70912	59.23	41.32	77.07
	20-21	45	118310	38.04	26.92	49.11
	22-24	63	134894	46.70	35.17	58.20
	25-29	54	134684	40.09	29.40	50.75
	30-34	23	72684	31.64	18.72	44.50
	35-39	5	36947	13.53	1.83	25.16
	40-44	0	12184	0.00	0.00	0.00
	45-61	1	3207	31.18	0.00	62.36
	Total	233	583822	39.91	34.78	45.03
Other	17-19	18	14798	121.64	65.55	177.42
	20-21	15	26429	56.76	28.11	85.24
	22-24	16	36322	44.05	22.51	65.46
	25-29	7	58583	11.95	3.17	20.67
	30-34	16	54920	29.13	14.89	43.29
	35-39	7	49587	14.12	3.75	24.42
	40-44	3	27671	10.84	0.00	21.68
	45-61	2	8164	24.50	0.00	48.99
	Total	84	276474	30.38	23.88	36.86
Total	Male	2231	4066552	54.86	52.59	57.14
Female						
White	17-19	63	33657	187.18	140.95	233.27
	20-21	77	57682	133.49	103.66	163.23
	22-24	67	72020	93.03	70.75	115.24
	25-29	45	70915	63.46	44.91	81.93
	30-34	24	37615	63.80	38.30	89.18
	35-39	8	16868	47.43	14.80	79.85
	40-44	0	4793	0.00	0.00	0.00
	45-61	0	1339	0.00	0.00	0.00
	Total	284	294890	96.31	85.10	107.50

+95% confidence intervals.

TABLE XII (CONT'D)

INCIDENCE RATES FOR OTHER NEUROTIC DISORDERS/NEUROTIC DISORDERS NOS BY SEX, RACE, AND AGE

Female	Age Group	No. of Cases	Person-Years At Risk	Incidence Rate	Confidence Intervals+ Lower	Upper
Black	17-19	8	10104	79.17	24.70	133.30
	20-21	14	17518	79.92	38.18	121.41
	22-24	15	23541	63.72	31.56	95.70
	25-29	13	24495	53.07	24.32	81.66
	30-34	7	11611	60.29	16.01	104.27
	35-39	3	4242	70.72	0.00	141.45
	40-44	1	999	100.11	0.00	200.21
	45-61	0	153	0.00	0.00	0.00
	Total	61	92663	65.83	49.30	82.30
Other	17-19	6	1652	363.17	75.67	648.80
	20-21	6	2978	201.51	41.99	360.00
	22-24	5	3903	128.10	17.36	238.16
	25-29	0	4112	0.00	0.00	0.00
	30-34	0	2349	0.00	0.00	0.00
	35-39	1	1060	94.30	0.00	188.59
	40-44	0	285	0.00	0.00	0.00
	45-61	0	48	0.00	0.00	0.00
	Total	18	16388	109.84	59.19	160.21
Total	Female	363	403940	89.86	80.62	99.10
Total	Enlisted	2594	4470493	58.02	55.79	60.26

+95% confidence intervals.

TABLE XIII

COMPARISONS OF NEUROTIC GROUPS ON DEMOGRAPHICS AT TIME OF BEGINNING OF OBSERVATION PERIOD OR ENTRY INTO SERVICE

	Anxiety		Hysteria		Phobia		Obs-Comp		Depress.		Other/NOS	
	f	%	f	%	f	%	f	%	f	%	f	%
Sex												
F	138	14.1	136	17.8	21	8.4	7	6.1	204	16.6	365	14.1
M	843	85.9	630	82.2	228	91.6	108	93.9	1025	83.4	2230	85.9
Age, Y												
< 20	580	59.1	488	63.9	128	51.4	62	54.4	709	57.7	1702	65.6
20 -- 21	178	15.1	128	16.8	59	23.7	19	16.7	221	18.0	462	17.8
22 -- 24	120	12.2	86	11.3	27	10.8	14	12.3	141	12.5	241	9.3
25 -- 29	71	7.2	48	6.3	25	10.0	14	12.3	110	9.0	139	5.4
> 29	32	3.3	14	1.8	10	4.0	5	4.4	47	3.8	49	1.9
Education , Y												
8 -- 11	171	17.4	170	22.2	47	19.0	19	16.5	211	17.2	570	22.0
12	715	72.9	529	69.1	172	69.4	79	68.7	894	72.7	1851	71.4
13 -- 18	95	9.7	67	8.7	29	11.7	17	14.8	124	10.1	173	6.7
Mental group*												
1 – 2	306	36.1	226	35.5	74	32.9	45	43.7	456	43.8	795	35.8
3	233	27.5	185	29.0	65	28.9	34	33.0	294	28.2	658	29.6
4 – 5	309	36.4	226	35.5	86	38.2	24	23.3	292	28.0	769	34.6

*Lower scores indicate better mental aptitude

TABLE XIV

COMPARISONS OF NEUROTIC GROUPS AT TIME OF HOSPITALIZATION

	Anxiety		Hysteria		Phobia		Obs-comp		Depress.		Other/NOS	
	f	%	f	%	f	%	f	%	f	%	f	%
Paygrade												
E-1	119	15.8	159	23.9	38	17.6	8	9.1	144	13.5	378	16.7
E-2 – E-3	272	36.1	298	44.8	89	41.2	25	28.4	439	41.2	1053	46.5
E-4 – E6	362	48.1	208	31.3	89	41.2	55	62.5	482	45.3	832	36.8
Length of service, Y												
0 - 1	317	38.2	370	53.8	118	51.5	32	31.7	530	46.8	1185	51.1
2 - 6	259	31.1	218	31.7	59	25.7	28	27.8	341	30.1	780	33.6
> 6	255	30.7	100	14.5	52	22.7	41	40.6	262	23.1	356	15.3
Term enlistment, Y												
4	512	66.8	473	74.8	153	73.2	61	64.2	798	74.8	1622	76.0
Other	254	33.2	159	25.2	56	26.8	34	35.8	269	25.2	512	24.0
Number of enlistments												
1	501	62.9	517	79.8	158	72.1	53	54.1	779	70.0	1739	77.7
> 1	295	37.1	131	20.2	61	27.9	45	45.9	334	30.0	500	22.3
Type of diagnosis												
Primary	520	62.7	470	68.3	169	73.8	42	41.6	894	78.9	1152	49.6
Other	310	37.3	218	31.7	60	26.2	59	58.4	239	21.1	1169	50.4
Number of diagnoses												
1	289	34.8	248	36.0	113	49.3	24	73.8	399	35.2	291	12.5
2	305	36.7	263	38.2	66	28.8	36	35.6	439	38.7	853	36.8
3 - 8	236	28.4	177	25.7	50	21.8	41	40.6	295	26.0	1177	50.7
Hospital discharge												
Direct	511	61.6	494	71.8	100	43.9	66	65.3	595	52.7	1782	76.9
Holding Company	206	24.8	114	16.6	111	48.7	19	18.8	362	32.0	188	8.1
Other	112	13.5	80	11.6	17	7.5	16	15.8	173	15.3	348	15.0
EPTES												
Yes	121	14.7	122	17.9	104	45.4	30	30.0	405	36.1	166	7.7
No	703	85.3	558	82.1	125	54.6	70	70.0	718	63.9	2123	92.7
Days hospitalized												
0 - 5	458	55.2	282	41.0	126	55.0	46	45.5	410	36.2	1497	64.5
6 - 20	241	29.0	265	38.5	55	24.0	27	26.7	428	37.9	670	28.9
> 20	131	15.8	141	20.5	48	21.0	28	27.7	295	26.0	154	6.6

TABLE XV

COMPARISONS OF NEUROTIC GROUPS AT TIME OF DISCHARGE OR FOLLOW-UP*

	Anxiety		Hysteria		Phobia		Obs-comp		Depress.		Other/NOS	
	f	%	f	%	f	%	f	%	f	%	f	%
Marital status												
Single	273	35.5	266	42.9	100	47.8	30	31.3	461	43.0	1066	48.9
Married	404	52.6	291	46.9	89	42.6	59	61.5	502	46.8	925	42.4
Divorced	91	11.8	63	10.2	20	9.6	7	7.3	109	10.2	190	8.7
Age, Y												
17 - 24	385	46.4	424	61.8	127	55.5	37	36.6	572	50.5	1480	63.8
25 - 34	262	31.6	201	29.3	64	27.9	31	30.7	375	53.1	655	28.2
> 34	183	22.0	61	8.9	33	16.6	33	32.7	186	16.4	184	7.9
Length of service, Y												
0 - 2	276	33.3	309	44.9	120	52.4	33	32.7	516	45.5	1114	48.0
3 - 6	234	28.2	226	32.8	45	19.7	20	19.8	285	25.2	708	30.5
> 6	320	38.6	153	22.2	64	27.9	48	47.5	332	29.3	499	21.5
Paygrade												
E1	118	14.2	171	24.9	39	17.0	13	12.9	173	15.3	533	23.0
E3 – E3	230	27.7	241	35.0	84	36.7	21	20.8	375	33.1	872	37.6
> E3	482	58.0	276	40.2	106	46.3	67	66.3	585	51.6	916	39.4
Total hospitalization												
1	300	36.1	274	39.8	135	59.0	32	31.7	457	40.3	957	41.2
2 - 3	312	37.6	259	37.6	69	30.1	46	45.5	439	35.7	951	41.0
> 3	218	26.3	155	22.5	25	10.9	23	22.8	237	20.9	413	17.8
Medical board												
0	669	80.6	555	80.7	161	70.3	80	79.2	881	87.8	2133	91.9
1-5	161	19.4	133	19.3	68	29.7	21	20.8	252	22.2	188	8.1
Physical evaluation board												
0	740	89.2	609	88.5	200	87.3	91	90.1	1027	90.6	2241	96.6
1 - 3	90	10.8	79	11.5	29	12.7	10	9.9	106	9.4	80	3.4
Promotion												
0	135	16.3	154	22.4	60	26.2	8	7.9	216	19.1	432	18.6
1 - 2	302	36.4	293	42.6	103	45.0	36	35.6	478	42.2	1055	45.5
> 2	393	47.3	241	35.0	66	28.8	57	56.4	439	38.7	834	35.9
Demotions												
0	647	78.0	494	71.8	204	89.1	77	76.2	900	79.4	1562	67.3
> 0	183	22.0	194	28.2	25	10.9	24	23.8	233	20.6	759	32.7

* Differences between neurotic subgroups significant at p<.0001 on all variables.

TABLE XV (CONT'D)

COMPARISONS OF NEUROTIC GROUPS AT TIME OF DISCHARGE OR FOLLOW-UP*

	Anxiety		Hysteria		Phobia		Obs-Comp		Depress.		Other/NOS	
	f	%	f	%	f	%	f	%	f	%	f	%
Unauthorized absences												
0	676	81.4	506	73.5	183	79.9	81	80.2	901	79.5	16 39	70.6
1	92	11.1	77	11.2	27	11.8	13	12.9	128	11.3	384	16.5
2 - 3	49	5.9	73	10.6	12	5.2	6	5.9	76	6.7	214	9.2
> 3	13	1.6	32	4.7	7	3.1	1	1.0	28	2.5	84	3.6
Desertion												
0	762	91.8	596	86.6	198	86.5	95	94.1	1041	92.0	2048	88.2
1 - 5	68	8.1	92	13.4	31	13.5	6	5.9	91	8.0	273	11.8
Attrition												
No	264	31.8	186	27.0	42	18.3	40	39.6	289	25.5	645	27.8
Yes	566	68.2	502	73.0	187	81.7	61	60.4	844	74.5	1676	72.2
Recommend reenlistment												
No	283	34.1	331	50.5	76	33.5	32	33.3	369	33.2	1380	26.0
Physical disabilities	264	31.8	160	24.4	107	47.1	28	29.2	436	38.5	231	10.6
Yes/other	265	31.9	164	25.0	44	19.4	36	37.5	305	26.9	567	63.4
Remained in Navy after '92	151	15.4	78	10.2	20	8.0	14	12.2	96	7.8	274	10.6

* Differences between neurotic subgroups significant at p<.0001 on all variables.

TABLE XVI

SUMMARY OF SEVERITY/DURATION INDICATORS*

Indicator	Neurotic Group					
	Phobia	Depress.	Hysteria	Obs-comp.	Anxiety	Other/NOS
EPTES						
Yes	45.4	36.1	17.1	30.0	14.7	7.7
Days hospitalized						
>5	45.0	63.9	59.0	54.4	44.8	35.5
Refer to medical board						
Yes	29.7	22.2	19.3	20.8	19.4	8.1
Early attrition						
Yes	81.7	74.5	73.0	60.4	68.2	72.2
Recommend Reenlist.						
No and Disability	80.6	71.7	74.9	62.5	65.9	36.6
Remained in Navy						
Yes	8.0	7.8	10.2	12.2	15.4	10.6

*Percentage meeting criterion; Differences between neurotic subgroups significant at $p<.0001$ on all variables.

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13. ABSTRACT *(Maximum 200 words)*

As the second study in a series of investigations of the incidence and outcome of mental disorder in the US Navy, this study focuses on men and women diagnosed with a neurotic disorder. The objectives of this study were (1) to determine first hospitalization incidence rates in an initially healthy young adult population by gender, race, and age, and to evaluate the effects of other demographic characteristics on onset and course of illness; and (2) to determine duration of acute illness, severity, and posthospital outcomes in terms of military performance and premature personnel losses. First hospitalizations for neurotic disorders were extracted from automated medical record data files for all active-duty Navy personnel admitted between 1980 and 1988. Incidence rates were calculated for major demographic subgroups, and career history records provided a 4-year follow-up of service-related outcomes. Overall incidence ranged from a low of 3 per 100,000 for obsessive-compulsive disorders to a high of 58 per 100,00 for Other Neurotic Disorders/NOS. The Phobia and Depressive groups had the poorest prognoses for continued service, and the NOS and Anxiety groups had the best prognoses.

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